

FINAL REPORT OF INVESTIGATION A&I E18267

July 2, 2018
Smoke Event

W-0028

Adopted by the Washington Metrorail Safety Commission at its meeting on March 12, 2020.

Washington Metrorail Safety Commission
777 North Capitol Street, NE, Suite 402
Washington, DC 20002



FINAL REPORT OF INVESTIGATION A&I E18267**SMS # 20180705#72432**

Date of Event:	7/2/2018
Type of Event:	Fire/smoke occurring on or in: c. Tunnel or right-of-way. Includes fire/smoke resulting in non-serious injury and/or property damage. Includes fire/smoke related to power jumper, track feeder, transition, and expansion cables, which require an investigation report.
Incident Time:	20:13 hrs.
Location:	Capital Heights
Time and How received by SAFE:	20:15 hrs., SAFE on Call
FTA/TOC Notification Time:	21:00 hrs.
Responding Safety Officers:	WMATA SAFE: Yes TOC: No Other: N/A
Rail Vehicle:	N/A
Injuries:	None
Damage:	Flashed cables and switch gear
Emergency Responders:	TRST-ERT, PGFD, ATC and PWR

Executive Summary

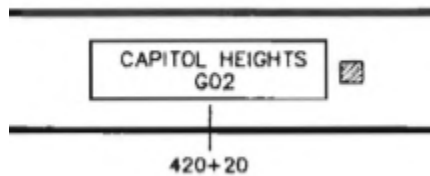
On Monday, July 02, 2018 at approximately 20:13 hours, Rail Operation Control Center (ROCC) received a report from the Train Operator (T/O) of Train ID 707 berthed at the 8-car marker, Capital Heights Station (G02), Track 2 that smoke was evident in the station. Tunnel ventilation was activated and all trains in the area were instructed to shut down their train's environmental system. Third rail power was de-energized at Capitol Heights Tracks 1 and 2. Upon further investigation and report from Station Manager, smoke was found emitting from AC room 104.

Revenue train service was suspended between Morgan Blvd Station and Benning Road, power was removed, and a bus bridge was initiated. Silverline train service was Wiehle to Largo Town Center. Track and Structure Emergency Response Team (TRST ERT), Prince George Fire Department (PGFD), Automatic Train Control (ATC) and POWER departments were dispatched and arrived at the scene.

Incident Site

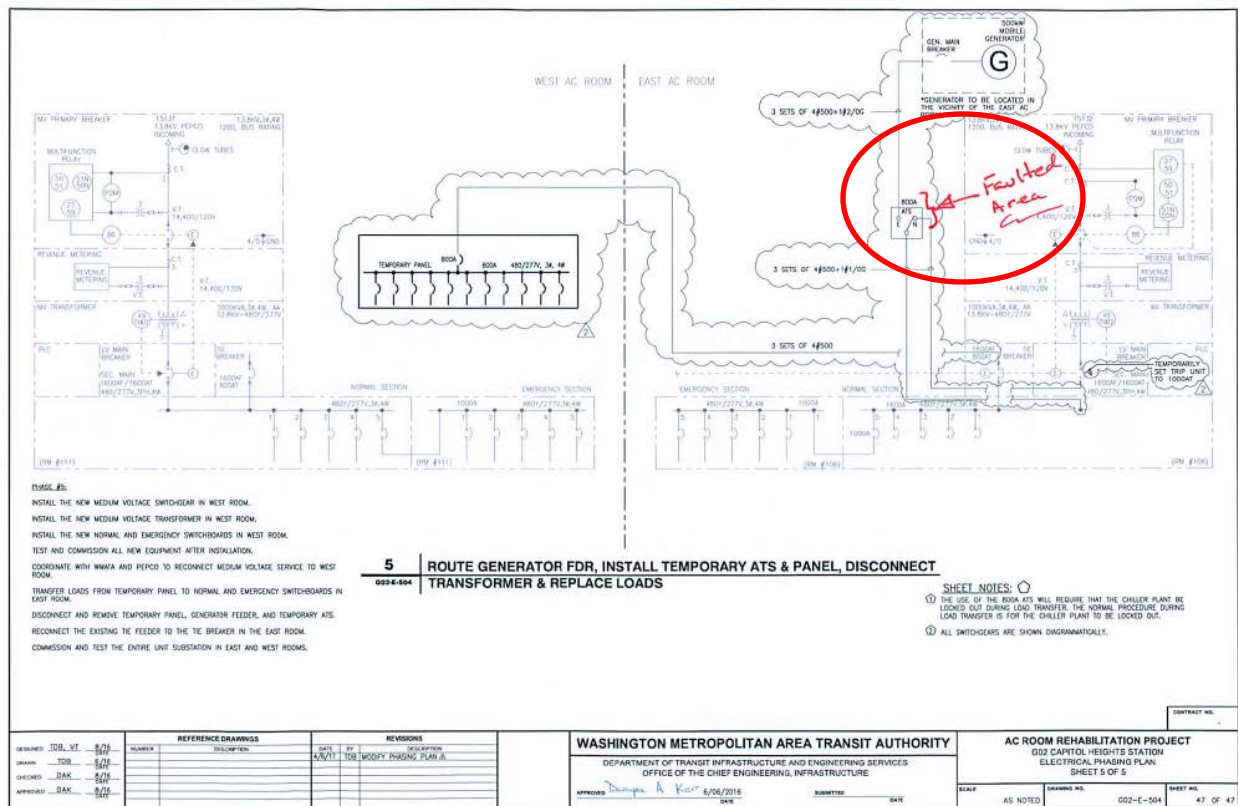
Capital Heights (G02)

Field Sketch/Schematics



Investigation

On Monday, July 2, 2018 at approximately 20:15 hrs., the fire incident was reported via MOC Alert when Maintenance of Way Engineering (MOWE) Power Department crews reported smoke from the AC Switchboard Room 104. When notified, the Infrastructure Renewal Program Group (IRPG) Inspector responded to the Capitol Heights Station (G02) to assess damage. The initial report indicated that smoke originated from the transformer. However, further investigation indicated that the smoke was contained to the disconnect located between the switch gear and the automatic transfer switch. Based on the investigation of the fire incident, it was revealed that the fire started in the AC room where the temporary disconnect and transfer switch were located. Cables and other apparatus were inspected to discover the root cause to implement corrective actions and preventive measures.



Above diagram is showing where it is believed the wiring caught fire.

Weather

At the time of the incident, the temperature was 90 °F, and clear. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: National Oceanic Atmospheric Administration (NOAA) – Location: Washington, DC.)

Findings

- Cables in use was supposed to be in temporary mode not exceeding 6 months, however they were up and running around 18 months
- There were no records of periodic inspection being performed.

Conclusion

Based on the salient facts, SAFE concurs with POWER findings and has concluded the root cause of this incident cannot be determined. There is no specific item that leads to

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 Approved By: SAFE 70 – 02/04/2020

a conclusion other than the insulation of the temporary cables at some point faulted, however, there is too much damage to pinpoint where. It appears that the cable faulted at the normal side of the transfer switch. The fault could have occurred in the insulation of the cable which was an aged cable. Also, the fault could merely have been chafed against the grounded enclosure [weight] to the point of a fault occurring. The installation of the materials along with the material itself was acceptable to standards of both National Electrical Code (NEC) and WMATA. The cables were not overloaded. The loads were known and checked before installation even began. It's important to note that while the fire occurred in the temporary generator system wiring, the generator itself and its operation had nothing to do with the fire. The sequence of events, abbreviated, indicate that the "normal side of the transfer switch" faulted causing the fire. The generator was not running. When Operations responded to the fire, their first order of business was to cut power which is typical. This in turn activates the generator. Later, the generator and output were de-energized as well. The load side wiring from the transfer switch was not damaged supporting the conclusion that there was no load issue. Due to an unknown root cause, SAFE has no further actions on this matter and recommends E18267 for closure.

Corrective Action

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1. POWER shall take the appropriate action deemed necessary to support prevention of repeated recurrence.
 - a. **For all future contracts or projects that require the use of a temporary generator, the electrical system supporting or tied into the generator system, including required equipment, such as the wiring system will now be installed in accordance with permanent procedures. Doing this eliminates the potential fault of exposed cables.**
 - b. **For new design requirements, all cable installed will be new stock to eliminate the possibility of using damaged or degraded cables.**
 - c. **POWER will conduct a bi weekly visual inspection of all associated equipment such as the transfer switch, disconnect switches, circuit breakers and cables. Every month a maintenance checklist and confirmation of the integrity of the system will be provided.**

Note: POWER has developed a process for corrective action and will insert it into formal contract documents for future contracts. Once a specific contract is awarded, the submittal process will take place that will include the Preventive Maintenance Inspection (PMI) procedure and check points

Photos



Photo 1 - Outside view of the switch gear controller



Photo 2 – Outside damage cables



Photo 3 – Internal cable damage



Photo 4 – Internal fire damage

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Photo 5 – Internal fire damage